



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

**BARJESTEH, MICHAEL**

Serial No.: 10/635,052

Filed: August 6, 2003

For: Hand Held Flexible Mount Leak Detector :

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: Group Art Unit: 2875

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: Examiner: Stephen F. Husar

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**DECLARATION UNDER 37 CFR §1.131 OF ROBERT GILBERT**

I, Robert Gilbert, declare that:

1. My home address is 445 Veraa Place, Paramus, New Jersey 07652.
2. I received a B.S. and M.S. in Mechanical Engineering from Fairleigh Dickinson University.
3. I have held the position of Product Engineer, Mastercool, Inc., Randolph, New Jersey from January 3, 2000 to present. I have more than 30 years of engineering experience in the fields of mechanical and electrical engineering including cryogenic systems, refrigeration plant design and construction, technical and commercial evaluation of prototype products, and automobile air conditioning repair tools.

4. A significant proportion of Mastercool's business involves automotive air conditioning tools and equipment. My responsibilities as Product Engineer for Mastercool include evaluating the technical and commercial aspects of prototype products for the market place as well as working with our patent attorneys to prepare and review technical disclosures and drafts of patent applications.
5. At a date prior to July 5, 2001 and at the corporate offices of Mastercool in Randolph, New Jersey, Michael Barjesteh described to me a leak detector for use with automotive air conditioning systems. He described the leak detector as hand held with a flexible shaft attached to a handle, the flexible shaft which could be bent into a variety of positions, and a blue/UV light emitting diode or LED attached to the end of the flexible shaft. At that time it was known that leaks could be detected by illuminating a florescent dye substance, added to the air conditioning system, with blue/UV light.
6. Prior to July 5, 2001, Michael Barjesteh showed me a working prototype of his hand held leak detector which had been made by Tien-Ching Chang of Sun Wonder Industrial Co., Ltd., 30 Lane 666, Sec. 1, Wan-Shou Road, Kwei-Shan Hsang, Tao Yuan, Taiwan following specific instructions from Mastercool. The prototype leak detector had a blue/UV LED mounted at the end of a flexible shaft which was attached to a handle. The flexible shaft could be bent into a variety of positions in relation to the handle which permitted the LED light head to be positioned in a variety of alignments. I physically held the prototype leak detector, turned the blue/UV LED on and off, and bent the flexible shaft.

7. Prior to July 5, 2001, I received two pages of drawings from our patent attorneys, Mathews, Collins, Shepherd & McKay. I reviewed the drawings which are shown in Exhibits B-10 and B-11 with dates masked. The drawings shown in Exhibits B-10 and B-11 used the reference numbers of the provisional patent application 200, 202, 204, 206, 208 and 210. The provisional patent application describes the reference number 200 as a “flexible mount leak detector 200.” The provisional patent application describes the reference numbers 202, 204 and 206 as “a body 202, flexible stalk 204 and a sensor probe head 206.” The provisional patent application describes the reference numbers 206, 208 and 210 as “the sensor probe head 206 contains a UV/Blue LED source 208 and a halogen sensor access port or halogen sensor 210.” I faxed the drawings and my textual narrative which is shown in Exhibits B-12 and B-13 with dates masked to our patent attorneys prior to July 5, 2001.
8. On July 11, 2001 I received by facsimile a cover letter shown in Exhibit B-14 with a final draft of the patent application to review from our patent attorney.
9. I am informed and believe that copies of the drawings shown in Exhibits B-10 and B-11 were incorporated in the Provisional Patent Application that Michael Barjesteh caused to be filed on July 12, 2001.
10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and like so

made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issued thereon, or any patent to which this verified statement is directed.

Date:

7/14/04

By:

Robert Gilbert  
Robert Gilbert

### Background of invention:

The invention addresses the need by the refrigeration industry for a small leak detector with remote sensing that combines a halogen sensor and ultraviolet source to illuminate fluorescence dye. Small refrigerant gas sensors are available but they do not combine gas sensor with ultraviolet source. The detection of a refrigerant leak from an A/C system can be accomplished by injecting a fluorescent dye into an A/C system and using a UV light to detect the dye at the leak site. The leak may also be detected by using a halogen gas detector. Leaks may be very difficult to detect and pinpoint when using only gas detector or when using only UV light. Nature of leak will determine which method works best. Best method to use may not be known in advance.

Due to space limitations it has not been possible to locate a gas sensor and UV light on a small common probe. With a L.E.D. UV light emitting source, 425/460 NM centered illumination, a small flexible probe can be used to access leak sites that have limited access( such as automobile engine compartments). A UV source maybe large and get hot under normal operating conditions. Heat of this magnitude could be a hazard in the confined quarters of an automobile engine compartment.

### Summary of Invention

It is the object of the invention to provide a means for detecting refrigerant leaks from a system that has environmental access restrictions and requires specific detection methods. The invention consists of a body, flexible connection, sensor probe with UV source and halogen sensor access port or halogen sensor. The body provides for hand held portability, electrical power for UV source, and electrical power for L.E.D. Flexible connector provides fixed multiple positions of sensor head and a conduit for electrical power required by remote mount sensors. Flexible connector also provides pneumatic conveyance required by sensor head. Sensor head is connected to body by flexible connector. Sensor head locates and mounts UV source (L.E.D. or other), gas sensor or port opening.

UV source maybe a L.E.D. mounted in sensor head with power supply mounted in sensor head or power supply mounted in body. UV source maybe mounted in body with conduit means to sensor head. The gas detector maybe a sensing device mounted in sensor head with electronic circuitry mounted in sensor head or body.

A L.E.D. will generate UV light of a frequency centered at 425 NM or 460 NM. Another UV source maybe a tungsten halogen lamp with filter mounted in sensor head or mounted in body. LED UV source requires very little power enabling the use of a small and portable battery device. A separate lens to pass UV light is not required as LED generates energy in the UV region saving cost, weight, and cost.

Mathews, Collins, Shepherd & McKay, PA

**Exhibit B-12**

Application No. 10/635,052

General advantages of combination leak detector:

Flexible end with LED sensor and gas detector sensor-

LED generates almost no heat; most UV light sources today generate large amounts of heat requiring turning light off after approximately 3 minutes of use and cooling off for a period of time before using again. LED is small enabling access to areas that maybe a problem with standard lights.

LED's use almost no power compared to incandescent bulbs. Although LED's do not put out as much UV, if they are mounted close they work well (small size can be mounted close to leak site).

Frequency available is centered at 470 and 430 NM. A narrow range that does not require filters to excite fluorescent dye.

Halogen leaks can respond to dye leak checks or gas detection leak checks. Some leaks only respond to one or the other. Having both dye and gas detection in the same probe provides an advantage in detecting leaks.

Mathews, Collins, Shepherd & McKay, PA

**Exhibit B-13**

Application No. 10/635,052

# MATHEWS, COLLINS, SHEPHERD & GOULD, P.A.

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DAVID P. KRIVOSHIK

H. HUME MATHEWS (1911-1989)  
MARTHA G. PUGH (1913-1992)

## FAX

July 11, 2001

To:

Bob Gilbert  
Mastercool, Inc.

Fax: 973-252-2455

Re: Flexible Mount LeakDetection  
Our No.: 818-123P

From:

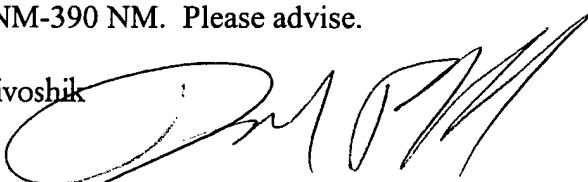
David P. Krivoshik  
Mathews, Collins, Shepherd & Gould, P.A.  
Phone: (609) 924-8555  
Fax: (609) 924-3036

Total number of pages, including this:

Please find a copy of the provisional patent application for your review prior to filing.

There is one issue of concern in that your notes describe UV light of a frequency centered at 425 NM or 460 NM. 400 NM to 450 NM is violet light. Ultraviolet is below 400 NM. With the Nichia UV LED producing from 370 NM-390 NM. Please advise.

David P. Krivoshik



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Mathews, Collins, Shepherd & McKay, PA

**Exhibit B-14**

Application No. 10/635,052



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**DECLARATION UNDER 37 CFR §1.131 OF DAVID PETER KRIVOSHNIK**

I, David Peter Krivoshnik, declare that:

1. My home address is 113 Wertsville Road, Ringoes, New Jersey 08551.
2. I received a dual B.S. from Rutgers University in 1976 as a George H. Cook Scholar with thesis, a M.E. degree in Electrical Engineering and Computer Science from Stevens Institute of Technology in 1978, and a J.D. degree from Rutgers Law School in 1994.
3. I have held the position of Patent Attorney with Mathews, Collins, Shepherd & McKay, P.A., Princeton, New Jersey from May 1, 2000 to present.
4. Prior to July 5, 2001 I sent to Robert Gilbert, who was my contact person at Mastercool, Inc., Randolph, New Jersey, two pages of drawings and a draft of the provisional patent application.



5. On Friday June 30, 2001 I left my office at Mathews, Collins, Shepherd & McKay to go on vacation with my wife and five children.
6. Wednesday July 4, 2001 was a holiday. I was out of the office on Thursday July 5, 2001 and Friday July 6, 2001. July 7, 2001 and July 8, 2001 were a Saturday and Sunday.
7. On Monday July 9, 2001 I returned to my office at Mathews, Collins, Shepherd & McKay and went through my accumulated e-mail messages, telephone messages, voice mail messages, facsimiles and correspondence, which included drawings and textual material concerning the provisional patent application draft from Robert Gilbert, who was my contact person at Mastercool, Inc., Randolph, New Jersey.
8. On Tuesday July 11, 2001 I had a 44 page final draft of a provisional patent application sent by facsimile to Robert Gilbert for review prior to filing.
9. On Wednesday July 12, 2001 I filed this provisional patent application with the USPTO by United States Postal Service Express Mail which was assigned Serial No. 60/304,928.
10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity

of the application, any patent issued thereon, or any patent to which this verified statement is directed.

Date: July 20, 2004

By: 

David Krivoshik